**The social determinants of child health and inequalities in child health**

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**Abstract**

Social factors have a profound impact on child health – they are the “causes of the causes”, creating social gradients and inequalities in almost all morbidities. The social determinants of health are complex and intertwined, and in the UK child health inequalities are entrenched and intractable. We describe how longitudinal research on children’s health and life course trajectories gives us insights into the ways in which the social determinants interact to affect children, and how these insights can shape policy and practice to improve child health. We also touch on three major contemporary issues in child health: adverse childhood experiences, the Covid-19 pandemic and climate change. We explore how paediatricians can engage with the social determinants of child health and be agents for change, and share examples of innovative practice.

**Keywords** (health, health inequalities, children, social determinants of health, birth cohorts)

**Overview**

It is often a shock to both paediatricians and the public to learn that the health and wellbeing of children in the UK lags far behind what we might expect in the world’s 6th largest economy. When UNICEF published its first report on child wellbeing in rich countries in 2007, the UK was ranked bottom of 21 countries and, although its ranking improved somewhat in subsequent reports, in 2020 the UK was ranked 27th out of 38 countries, across measures of child mental well-being, physical health, and academic and social skills – all of which are important for lifelong health and wellbeing.

It can also feel disheartening for paediatricians and other health professionals who work with children to realise how many of the determinants of child health lie outside of the traditional remit of the service they provide. The World Health Organisation defines the social determinants of health as “*the conditions in which people are born, grow, live, work and age*” and estimates that more than half of inequalities in non-communicable diseases are accounted for by social inequalities in risk factors. These risk factors can be: structural aspects of what Unicef (**Figure 1**) calls ‘the world at large’, such as income inequality, educational provision, and the quality of the environment; in ‘the world around the child’, such as resources available in their household, school and neighbourhood; and in ‘the world of the child’ including their relationships with family and friends, and their behaviours and activities.

Concerns about child health, and policies aimed at improving children’s outcomes, are often focused on the most vulnerable children – those living in poverty, or in deprived neighbourhoods, children who are migrants/refugees/asylum seeking, those who are abused and/or neglected. However, it is important to remember that there are *gradients* in almost all aspects of child health (autism and Type I diabetes mellitus are notable exceptions), just as in adult health; the health of children in families who are just below the top rung of the social ladder is not as good as those who are at the very top (**Figure 2**).

Together, inequalities *between* the UK and other countries in the broader structural social determinants of health, and inequalities *within* the UK in the social determinants more proximal to the child, shape the sub-optimal health and wellbeing of UK children on average and across the socioeconomic spectrum. A theoretical example is given in **Figure 3** where there are detriments to health for children living in a more unequal society compared to children living in a more equal one, and these detriments compound the impact of the gradient in family incomes on children’s health.

Variations in child health in international comparative studies are not only useful for highlighting where the UK falls short, they also show us that health inequalities are not inevitable. Taken together, the evidence on inequalities between and within countries, shows us that paediatricians need to advocate for the right to health and improvements in the conditions that promote and protect health for all children, articulated in the UN Convention on the Rights of the Child. The expectation that such advocacy will take place is accepted and promoted by the Royal College of Paediatrics and Child Health (RCPCH) in the UK.

**Interacting and intersecting inequalities**

Collectively, the distribution of the social determinants of child health within the UK is responsible for the distribution of child health – with marked differences across geographical areas, and between different identity groups. Historically, in official statistics on child health, and in research, the complexity of the social determinants have too often been oversimplified.

For example, health statistics may be presented by gender, or by ethnicity, but not by both gender *and* ethnicity together. Different ethnic groups may be grouped together, as when data for Bangladeshi, Pakistani and Indian origin children are classified together as South Asian, leaving differences between those groups (for example cultural or economic differences) unexplored.

**Figure 4** presents a framework for thinking about interacting and intersecting inequalities in the production of health, wellbeing and the quality of life. Although not produced specifically for children and young people, it offers a useful perspective for thinking about how the social determinants of health might interact to amplify both positive and negative health effects. For example, institutional racism may constrain the health advantages of accessing educational opportunities for some ethnic groups but not others, while the social capital manifest in some ethnic communities may be protective of health even in a context of economic deprivation. **Box 1** captures something of the debate on social capital and points to potential routes to interventions in the wider context of health inequalities via enhancing networks and connectivity and by building trust via the exercise of reciprocity within and between communities and service providers, possibilities that we return to below.

Until descriptive statistics and analytical models begin to grapple with and include this complexity, we will continue to fail to understand how the complexities of children’s lives shape their lifelong health trajectories.

Past research on the social determinants of child health has also tended to be methodologically as well as conceptually simplistic. Researchers might measure one indicator of a complex construct, for instance measuring household income as an indicator of family socioeconomic position, include it in a statistical model when trying to understand the causes of a child health outcome, and then think they have ‘controlled’ or ‘adjusted’ for all the complex ways in which family socioeconomic position actually relates to that health outcome.

In child health epidemiology, as in other areas of scientific research, it is a truism that all models are wrong but some are more wrong than others. Health research has been particularly dominated by the methods that were developed to generate evidence about the clinical effectiveness of treatments and interventions, particularly linear models of cause and effect grounded in randomized controlled trials. There are increasing calls for child health researchers to move away from these traditional methods to include consideration of the complex systems (including the social determinants) that produce child health and use of dynamic complex systems analysis to understand non-linear and complex pathways to health and disease. As Diez-Roux has pointed out, these models may help us understand such complex systems as (a) the interplay of genes and environment for child health, (b) the long-term effects and intergenerational transmission of early life experiences, (c) dynamic relations between health and social determinants over the life course and across generation, and (d) dynamic relations between area factors, individual-level factors, and health outcomes. Examples of such models can be seen in Diez Roux et al (2011).

**Following children’s health through the life course**

Understanding the interplay of the social determinants on child health in the short- and long-term means that longitudinal studies are essential. The UK has a very strong tradition of nationally representative and local birth and other family cohort studies (<https://www.closer.ac.uk/explore-the-studies/>) that have been the bedrock of our understanding of child health and development, and been foundational to the Developmental Origins of Health and Disease (DOHaD) approach – what used to be called the ‘fetal origins of adult disease’ hypothesis.

The first of the British birth cohort studies attempted to enrol every baby born in a single week in March 1946, into a study that continues to this day. Study members are now in their 70s and have participated in data collection waves 24 times over their lives. Nationally-representative birth cohorts were also started in 1958, 1970 and at the turn of the millennium; currently, a two-year project running from April 2021, is testing the feasibility of successful recruitment into a new UK-wide early life cohort study. In addition to the national studies, place-based birth cohort studies include the Avon Longitudinal Study of Parents and Children, Born in Bradford, Growing Up in Scotland, the Hertfordshire Cohort Study and Children Growing Up in Liverpool (C-GULL).

The knowledge coming from longitudinal studies has hugely advanced our understanding of the social determinants of health and has shaped health, educational and social policy. Two examples will suffice – (1) a study in the 1970 cohort found that ‘bright’ children from poor families were overtaken by less ‘bright’ children from affluent backgrounds by age 6, and this influenced the government to spend more on pre-school education; (2) in Born in Bradford researchers found that air pollution was linked to low birth weight and this supported the local authority’s decision to retrofit buses to reduce emissions.

Increasingly researchers are harmonising data across the different British studies to look at changes in child health over time, and harmonising with cohorts worldwide to understand child health in the UK in comparison to other societies.

**The contemporary context of child health**

Research on child health does not stand still and neither does the context in which children are born and grow up. This paper is an update of Spencer’s previous paper (Spencer 2018) on the social determinants of health for this journal, which we would encourage all paediatrics trainees to engage with. Three major issues for child health that have come to the fore since that publication are: increased understanding of the importance of adverse childhood experiences for health; the Covid-19 pandemic; and climate change and other environmental factors.

Adverse Childhood Experiences

The ACE pyramid (**Figure 6**) represents the mechanisms through which adverse childhood experiences influence morbidity and risk of mortality across the life course. ACEs are forms of physical and emotional abuse, neglect, and household dysfunction experienced in childhood that have been linked to: poor physical health, including heart disease and cancer; poor mental health, including addictions; poor social functioning; and premature mortality. The adverse social and environmental exposures experienced by children are manifested in psychological and physiological outcomes through the neurobiology of acute and chronic stress and through epigenetic changes. Although some adaptations to ACEs may be positive for some individuals, for example by increasing resilience, the overwhelming impact is negative. However, ACEs do not inevitably lead to health and social consequences for children, and their effects can be buffered, for example by relationships with nurturing adults or by trauma-informed treatment and therapy.

There is growing widespread recognition of the importance of ACEs in public health and clinical practice and increasing attempts to collect population-based ACEs data. For example: the Children’s Commissioner for England publishes data on ‘vulnerable children’; the current government Troubled Families programme targets families experiencing multiple problems, including crime, anti-social behaviour, truancy, unemployment, mental health problems and domestic abuse; and the World Health Organisation has developed a 43-item survey tool to measure ACEs internationally. Nevertheless, whether, when and how paediatricians should be screening for ACEs is contested, with questions of feasibility and acceptability unsettled and the potential benefits and/or harms as yet uncertain. The original American-based survey instrument to measure ACEs focussed on 10 adverse childhood experiences **(Box 2**), but other potentially traumatic experiences such as bereavement or being bullied were not included, and the measures were not intended for clinical use. The Royal College of Paediatrics and Child Health, in their written evidence to House of Commons Science and Technology Committee inquiry into Evidence-based Early-years Intervention in 2017 called for more research on screening and effective interventions.

The Covid-19 pandemic

It is too early to measure the full impact of the Covid-19 pandemic on children’s health and their long-term trajectories of health and social wellbeing. Children have not borne the largest burden of morbidity and mortality from Covid-19 but they may yet be the most egregiously affected, as their lives and those of their families have changed profoundly. All of the social determinants of health have been affected by Covid-19. Particularly relevant for children are the impacts on family socioeconomic status and security, including household incomes, employment, debt, food insecurity and housing insecurity, and on education. Educational inequalities are widening as school closures and digital exclusion have reduced opportunities for in-person learning the most for the poorest children. Access to routine health care, such as antenatal care and routine childhood immunizations, has been disrupted, again most profoundly for the poorest, and children’s physical activity levels, diets and mental health have also been adversely affected by lockdowns and school closures.

The effects of the pandemic will have differed by age, gender, ethnicity, disability and other characteristics. For example, primary school aged children may have experienced less adverse mental health consequences of being at home for long periods and unable to see their peers than adolescents. In the Born in Bradford study, children of Pakistani origin were less likely to be meeting government guidelines for physical activity during lockdown than White British children, boys were more likely to report negative changes in their psychosocial wellbeing than girls, and mothers of children with disabilities reported high levels of stress. Different regions of the UK, including its constituent countries, have also experienced very different pandemics, with some regions experiencing more prolonged restrictions and educational disruption, meaning that pre-existing geographical inequalities in child health and the social determinants of child health will be exacerbated.

The International Society for Social Pediatrics and Child Health is encouraging paediatricians and child physical and mental health providers worldwide to adopt a Child Rights Based Approach in their pandemic and post-pandemic practice, recognising that they have “an important role to play in developing equitable, transdisciplinary health care approaches that address all effects of the pandemic”. This includes: consistently affirming the dignity and rights of children and young people; promoting prevention, early intervention, and treatment programs with prioritization of the most marginalised; optimising Covid-19 testing regimes, maintaining ‘eyes on the child’ and delivering essential clinical and support services face-to-face where required; addressing unmet social needs such as food insecurity, poverty and housing instability through ‘social prescribing’ measures by linking with NGO and government supports; guiding parents on how to talk to children and young people about the pandemic and support their mental health whilst managing their own mental health; responding to and documenting increases in all aspects of violence toward children.

Some of the learning developed during the pandemic has emphasised the importance of coordination between services and better sharing of data. Public Health England’s use of a Vulnerability Hub to coordinate across agencies is one example. The benefits of information technology, for example by developing electronic vulnerability indexes and by maximising the potential of machine learning to help identify unidentified and unmet children’s needs across agencies have been given greater impetus.

Climate change and the environment

Public health, social justice and climate justice are intertwined. The World Health Organisation estimates that climate change is already responsible for more than 150,000 deaths annually worldwide with the effects felt most deeply among the poor and marginalised. Unicef estimates that almost every child on earth (>99 per cent) is exposed to at least one major climate and/or environmental hazard, shock or stress. Children are especially vulnerable to climate change and environmental factors such as extreme heat and air pollution as their immune, respiratory, metabolic systems and organs are still developing; climate change also affects child health indirectly through its impact on food and water systems, disease patterns and health system resilience. As with the pandemic, the effects of climate change and environmental factors are felt most by the poor - by children in low and middle income, and by poorer children in rich countries.

Organisations including the Royal College of Paediatrics and Child Health (<https://www.rcpch.ac.uk/key-topics/climate-change>) and Medact (<https://www.medact.org/membership/groups/climate-health/>) have special interest groups on climate, the environment and health that can support health professionals to advocate and campaign for climate and environmental justice.

**Equipping paediatricians to engage with the social determinants of health**

The Roya College of Paediatrics and Child Health *State of Child Health Report* highlighted the importance of prioritising early years inequalities. It provides guidance on how paediatricians can engage with these complex problems by exploring vulnerabilities beyond the immediate presenting complaint to ‘make every contact count’; to signpost families to sources of support; and to use data to advocate for children from disadvantaged backgrounds. Practical ways these aspirations can be achieved are presented by Singh et al (2018) and Singh and Damarell (2021). These ways include the importance of co-production with families via collaborative practice.

We can see in the RCPCH stance, and in the actions of paediatricians involved in innovative approaches to their practice in many locations, a shift in how we might characterise their future role. While there will be a need to continue to diagnose and treat children there will also be a role that sees paediatricians engaged with the causes of illnesses and injuries in a way that seeks to reduce their prevalence and modifies the social gradient of their occurrence. They will do this in collaboration with other professions and with those groups most affected by the conditions, and they will support the actions of these groups to reverse the disempowerment they experience in society.

**Examples of innovative practice**

The Connecting Care for Children project in London offers an example of a portfolio of interventions that together seek to enhance professional practice and to inform and empower patients and local community members. Specifically, the project has set up Child Health Hubs in which different professionals can work together - this encourages the widest possible insight into the problems children present with and allows these problems to be considered within the full context of their lives. In addition, there is a Patient Academy to facilitate sharing information and enhance the knowledge of all parties in the health encounter. There are Practice Champions, members of the local community who can be a bridge between service providers and recipients. (See [www.england.nhs.uk/integratedcare](http://www.england.nhs.uk/integratedcare) )

This project is an example of an approach to child health that seeks to return agency to the patient and family, to shift configurations of power in the health encounter and to do this by building alliances, by enhancing trust and reciprocity, and by setting up the scenario where everyone learns by doing. What it means for the stance of the doctor is captured in the words of Dr Yarmin Radak, a West London GP, she says the first question you ask when you meet a patient changes when you work in the context of connected care, it used to be “What’s the matter with you?”, now it’s “What matters to you?”.

In the USA, the Cincinnati Children’s partnership promotes a multi-agency approach which combines a population health focus alongside a quality improvement approach to child health, with a focus at the neighbourhood level (Beck et al 2019). Amongst its many innovative features are a partnership with lawyers who share a building with the clinical care team. This allows referrals for direct help with issues that profoundly impact on children’s health including: the quality of housing, the need to respond to domestic violence, access to education. But as well as the casework help this facilitates (via 700-800 referrals a year) it also leads to joint action for system change. For example, tenants associations can be helped to effectively mobilise for infrastructure improvements. Cincinnati’s All Children Thrive Network (ACT) co-produces solutions to children’s health issues with families and communities, and all agencies promote the utility of sharing data. Members of ACT ask, “What is working?” and “What led to that success?” as the starting point for the initiatives they promote.

Both in London and in Cincinnati paediatricians and other health professions are reshaping their professions via advocacy, alliances and action. All these require collaboration, and all are enhanced by the voices of the children, families and communities they seek to serve.

**Final Thoughts**

We began this consideration of the social determinants of child health and of inequalities in child health with a recognition of the massive challenges we face as we seek to not only improve child health but improve it for all children in a way that erodes inequalities. A part of the challenge lies in the complexity of the issues involved and we have explored these in some detail: the importance of the longitudinal view not just for understanding changing child health over time but also to capture new issues that rise in importance, a return to considerations of the impact of infectious disease in the context of Covid-19 and of the importance of engaging with the health consequences of climate change. But we have also reported shifts in the stance paediatricians and health researchers take that are reassuring. Paediatricians are not constrained to a limited set of responses but are engaging with a reconfigured attitude to the legitimate domain of their concerns and to the importance of forging alliances to seek change.

The Unicef multi-level framework of child well-being that we began with is an example of an ecological systems theory. It exists within the dimension of changing time, of what child psychologist Bronfenbrenner termed “a chronosphere”. That sense of the passage of time and the different challenges and possibilities it presents is, of course, crucial to understanding child development, it is not just what happens to the child but when it happens that determines the impact it has. But the passage of time is also important for the health professional, including for the paediatrician. We are not succeeding in eroding health inequalities in children or effectively tackling the social determinants of health. Now is the time for those joining the profession, as well as for those established within it, to do something different.

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**Practice Points (adapted from the International Society for Social Pediatrics and Child Health declaration on advancing health equity and social justice in response to Covid-19)**

* Establish systems of health care that serve the special health needs of children and young people in a manner that consistently affirms their dignity and rights.
* Promote prevention, early intervention, and treatment programs (including neurodevelopmental and early intervention services) with prioritization of the most marginalised children and young people and develop mechanisms to enhance their access to essential services.
* Develop a vocabulary that decreases stigma and provides culturally and developmentally appropriate, accessible, and evidence-based information, resources, and interventions.
* Address unmet social needs such as food insecurity, poverty and housing instability through ‘social prescribing’ measures by linking with NGO and government supports.
* Structure health services using a “two generation” approach, where caregiver health and mental health issues, including reproductive health, are addressed in concert with those of their children.

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